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ABSTRACT

The Educational Technology Center and the Teacher Education Program at the SUNY College at Old Westbury (New York) used a cooperative approach to integrate computer technology into the teacher education curriculum and to train pre-service teachers how to use this technology successfully in the classroom. In 1989, the Teacher Education Program felt itself slow in entering the computer age; many faculty considered themselves computer illiterate. The faculty formulated a plan to remedy this situation by integrating technology across the teacher education curriculum, by not relying on specialized courses, and by finding a leader to implement the change. Software was purchased and a computer lab was dedicated to the program. Some faculty taught themselves about the technology and then volunteered to teach others. The Teacher Education Program also held a computer conference in 1993. Factors critical to the success of the cooperative effort include: (1) identifying a technology leader; (2) having the support of the faculty and administration; (3) using the clout of outside groups such as state agencies which mandate change; and (4) making support of computer use and literacy development part of the organization's mission. (Contains 17 references.) (AEF)

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Cooperative Efforts to Integrate Computer Technology into Teacher Education Curricula

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Introduction

The College at Old Westbury is part of the State University of New York (SUNY). Founded in 1948, SUNY comprises 64 geographically dispersed campuses, of which four are university centers and 13 four-year colleges of arts and science. The other 47 colleges are colleges of technology and health science centers, as well as community colleges. SUNY Old Westbury is a small four-year college of arts and science with 4000 students and about 200 faculty. The College, founded in 1965, is located on a 600-acre site on Long Island, twenty five miles east of New York City.

SUNY College at Old Westbury is called the "College of the 21st Century", because its students, faculty, administration and staff reflect demographics predicted for the 21st century. Students range in age from 18 to 76, of which 58% are female. About 27% are African-American; 10% Hispanic-American; 6% Asian-American; 55% Caucasian; and 2% international students from 41 countries.

Responsibility for educational computing on campus is concentrated in the Educational Technology Center (E.T.C.) which now includes labs for languages, business and management, American studies, multimedia for social studies, computer science, natural sciences, and teacher education. There is also a small faculty lab. E.T.C. was founded in 1985 with funding from a Title III federal grant. This grant provided financial support for three years, after which the Center became fully supported by the College. For equipment and software, E.T.C. relies on SCAP funds. SCAP which stands for Students Computing Access Program is funded annually by the SUNY Central Administration. The program provides financial support to individual colleges within the system to acquire computer equipment and software, at the rate of about $18.00 per student per year.

Recognizing the value of educational technology in the instructional process, the College in 1991 restructured E.T.C.to combine the Academic Computing and Audiovisual Media departments. Prior to 1991, the Center's major objective was to provide adequate computing facilities to the college community. After the restructuring, the focus was expanded to include total support to faculty efforts to integrate educational technology into the curriculum.

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Several Teacher Education faculty expressed an interest in using the new technology and they had both a rough plan and a vision for technology development in their program. As a result, in late 1991, E.T.C. and Teacher Education joined hands to achieve the goal of implementation of educational technology into the curriculum. But why educational technology?

Educational Technology

In the last two decades, new technologies have advanced very rapidly and transformed in many ways the manner by which things are done in our daily life. This transformation has also affected education where computer, video, and telecommunications technologies have merged to create a powerful tool that can be successfully used in teaching and learning. As Knapper (1988) points out, "education has traditionally made quite extensive use of the products and processes of technology, from the chalkboard to the computer." It had been estimated that by the 1980's, 99 percent of all public schools in the United States used some form of educational technology (Robertson, 1994). In 1984 the ratio of computers in schools to students was 1:125. By 1991, it was 1:20. In addition, about 46 percent of school children now have a computer at home. (Maddux, Johnson and Harlow, 1993)

We, as educators, have an obligation to prepare all our graduates "... to live in, work in, compete in, and thrive materially, vocationally, and personally in the new milieu..." (Stowe, 1992). However, the vast majority of educators, at all levels of education, have not been fully prepared to meet the challenge of integrating new technologies into instruction. It is crucial that we address the question of how teachers are prepared to use technology to help students enter and compete in this new world and, in particular, how well faculty involved in teacher education programs equip their students, the teachers_to_be, to participate in the information age professionally and personally.

A number of studies have been conducted on the implementation of technology in teacher education. These studies have concluded that the use of educational technology has the potential to improve instruction and effectiveness, and save time. (American Association of Colleges for Teachers, 1987; Association for Educational Communication and Technology, 1981; Bosworth & Welsh, 1993; Byrum & Cashman, 1993; Reyes, Torp, & Voelker, 1993; Robinson,1993; Woodrow, 1993). However, the potential for improving teaching and learning will not be achieved unless teacher education instructors are well trained in the use of educational technology. (Centre for Educational Research and Innovation, 1992)

This paper discusses the cooperative efforts of E.T.C. and the Teacher Education Program at the College at Old Westbury over a period of five years to encourage faculty to integrate educational technology into the teacher education curriculum, and, in turn, to train pre_service teachers how to use this technology successfully in the classroom.

A Cooperative Effort to Build Computer Literacy

In the fall of 1989, the Teacher Education Program at the State University of New York, College at Old Westbury, felt itself to be way behind in entering the computer age. About 60 percent of faculty had computers at home on which they did word processing of their syllabi and exams. Special education instructors invited speakers to their classes once a semester to demonstrate software used in special education classrooms. (The speakers brought their own hardware and software.) The rest of the faculty considered themselves computer illiterate (interestingly, these were all men).

The Teacher Education Program had one elective computer course "The Microcomputer in the Elementary Classroom," taught by an adjunct instructor (the computer coordinator for a nearby school district), and no computer laboratory. In a given year, less than 10 percent of the teacher education enrollment of about 450 pre-service teachers could complete the course. The instructor of the microcomputer course taught students a bit of programming in BASIC and for several class periods brought in two of his own Apple IIGS computers to demonstrate educational software that he borrowed from his school district. Thus the 16 students in the class had four to six hours of class time devoted to "hands-on" work with computers.

Faculty in the Teacher Education Program discussed this sorry situation and emerged with a plan, nct as deliberate a plan as they would have liked, and more clear in hindsight than it was at the time, but a plan nevertheless. First of all, the Teacher Education faculty's preferred goal was to integrate technology across the teacher education curriculum and not to rely on specialized courses. They realized instinctively what Dell and Disdier (1994) concluded three years later. In a search of the literature on technology in teacher education, these researchers became convinced that in order for technology training to be effective, certain characteristics had to be present:

1. Educational technology training needs to be integrated into the entire teacher preparation curriculum, not taught in isolation, so that effective technology integration is modeled for pre_service students...;

2. The training must link technology with the instructional process and the curriculum. It must emphasize that technology is not an end in itself but rather, it is a means to an end_-which is the enhancement of teaching and learning...;

3. The training needs to be hands_on...; and

4. The training needs to be in_depth... Teachers need to be comfortable enough with computers..." (Dell & Disdier, 1994).

The Teacher Education Program's integrative approach was consistent with its emphasis on interdisciplinary instruction and equity of opportunity for all students. For years, it had required courses for pre-service teachers in multicultural education and interdisciplinary teaching strategies. The program supported the mission of the College which was to serve students who have been traditionally bypassed by higher education.

Secondly, they assessed their faculty. Things didn't look too good. In 1990, teacher education instructors were coping with a doubling of enrollment in the program due in large part to publicity regarding growing job opportunities for teachers. With large teaching and advisement responsibilities,they had little time or energy to take on the task of learning about technology.

Luckily, a faculty member eligible for a sabbatical during the coming academic year, offered to center her sabbatical plans around computers in education with the express purpose of returning to campus to share knowledge with colleagues and help establish a teacher education computer laboratory. This sabbatical plan was discussed and approved. While not stated explicitly at the time, this faculty member was to become the Program's technology leader (TL).

While the TL was away, the Chair of the Teacher Education Program successfully applied for SCAP funds to purchase 16 Mac LC computers with hard drives and Apple IIE cards (These cards enabled the Macs to run Apple software; the majority of educational software available was still designed for the Apple computer.). There were two arguments in their favor. After the Business and Management Department,the Teacher Education Program had the largest percentage of majors at the college and the Chair emphasized that they didn't seem to be getting their fair share of computer resources. A recent New York State Education Department re-registration review of the College had recommended that the College provide the Teacher Education Program with a "dedicated computer laboratory."

At this time, directorship of the Educational Technology Center (ETC) changed hands. The Center had been managed by staff with mostly technical expertise. One result was a Center that had been operating mostly for the benefit of computer science majors. Much of the SCAP funding was being spent on sophisticated equipment that the College was often unable to maintain properly. Less emphasis was being given to the needs of the student body at large which had such mundane needs as computers on which to word process their class assignments and papers. With the new director, the mission of ETC was clarified. It became more supportive of the needs of all academic programs In fact, the new director of ETC made this mission a condition of his accepting the position. This change of emphasis was an important development for the Teacher Education Program.

Upon return from sabbatical the TL volunteered to serve on the Academic Computing Committee, an advisory committee that sets policies and procedures for the operation of the academic computer labs and recommends how SCAP funds will be used. The TL was also designated computer coordinator for the Teacher Education Program, an unofficial title that provided no release time or compensation. It was simply an attempt on the part of the Teacher Education Program to make its fledgling efforts in the technology area less scattered and fragmented.

The TL drew up a list of recommended software for the Teacher Education Program, the Mac LCs arrived, and the lab was set up. The original order had included five and one-quarter inch disk drives for each computer (to run the Apple software--most of which was only available on this size disk). At the last minute, the drives had been cut out of the order to pay for anti-virus programs and security devices. And still no money was available for software. This was disappointing enough but then the Program was informed that, while they had priority for time in the lab, their 16 Macs were to be shared with the whole college. There turned out to be serious problems with this arrangement as some students mischievously tampered with the hard disks or accidently erased programs. Others, understandably, did not want to stop working when teacher education classes arrived. These difficulties were enough to completely discourage all but the most determined teacher education faculty.

We began to work on the problem of software. Arguing that the instructor of the microcomputer course had none with which to teach his course, the Teacher Education Program and the Director of E.T.C. convinced the Academic Vice President to approve a site license for LogoWriter. They were able to borrow Microsoft Works from one of the science programs where it was not being used. The TL began to develop a Logo unit on problem solving and informal geometry for her mathematics methods courses. After almost three years, we felt we were finally on the way.

In July 1992, a full academic year after the Mac LCs had been purchased, an order for about $4,000 of education software (about half of our original list) was finally approved. The programs arrived at the very end of August, too late to preview for fall classes.

Before we could even begin using the software, the Director of ETC convinced the TL to help write a modest proposal for a conference on computers in teacher education. Funds were available through a SUNY-wide organization called Faculty Access to Computer Technology (SUNY FACT). The goal of this very modestly-funded organization was to promote faculty use of computers across the curriculum and small grants were available for activities such as workshops and conferences.

As newcomers to technology, the only possible approach we could take was to design a conference that would inspire and teach us as much as the participants. When we sat down to brainstorm about the conference, several questions came up. What should be our priorities for training pre-service teachers? What do the schools want us to do to prepare our beginning teachers? What were other SUNY campuses doing to prepare their preservice teachers and engage their faculty with technology? With a $4000 grant from SUNY FACT, we invited teachers and administrators from nearby school districts to discuss what beginning teachers should know about technology in education. We invited teacher education colleagues from other campuses to tell us what they were doing. We shared the little we were doing. The conference was very successful and one result was that some of our teacher education faculty were inspired to begin to integrate technology into their coursework. For example, two reading instructors who were team teaching their bilingual and monolingual reading courses included a project where the bilingual and monolingual students used the computer to communicate with one another.

It took another year, and two events, before the Mac Lab was finally "dedicated" to the Teacher Education Program. SCAP funds provided a second Mac lab of 20-plus computers for use by other academic programs (particularly Journalism) as well as the larger student body, and the Middle States Association of colleges and schools repeated the State Education Department's recommendation for a dedicated lab for teacher education students.

Once the lab became our own, we thought we were settled but we weren't quite. One semester later, we moved from E.T.C. to the library. E.T.C. staff tries hard not to forget our lab but we have had to fight off efforts by the library director to open our lab to the entire library population (with no arrangements for supervision of students). The latest development is that we have just received a videodisc player (and one video disc). It needs only to be set up and we will begin learning how to use it.

Teacher Education Faculty Development

There have been several informal ways that the Teacher Education Program has encouraged faculty to become computer literate and to integrate computers or other technology into their courses. For one thing, we have already agreed to consider progress toward computer literacy and integration of technology into coursework as an important part of professional development. Secondly, the TL set an example by integrating computer technology into her courses. This example encouraged some faculty to begin thinking about their own. The TL has offered to show interested faculty the lab and to demonstrate software related to their instructional area. She has accompanied classes to the lab on their first visits.

Special education faculty who teach methods courses have been particularly motivated. This is because special education programs in schools have often been in the forefront in regard to the use of technology in learning.

The interest of three relatively new faculty members has come from several directions: their desire to participate in educational reform and change; the inspiration that they received from participating in our first computer conference; and their work with school districts.

Some faculty have made the transition from no knowledge to self-use; others from self-use to asking students to hand in assignments done on the computer. Others are ready to make a move to simple requirements or to full integration in their courses. According to research, the step from personal use to use in the instructional setting is one of the most difficult.(Wetzel, 1993, p. 349; Roberts and Ferris, 1994, p. 216) And it is common at some institutions for full implementation to be achieved by only one member out of an entire teacher education faculty. (Roberts and Ferris, 1994, p. 218)

Continuing Forward

The Teacher Education Program, in continuing cooperation with E.T.C. has not stopped pressing for change. Many things contribute to our momentum. The TL does many independent studies with students The independent study students not only help to provide a bit more access to the lab, they demonstrate software in other methods classes and assist beginning students with simple problems. A goal is to develop a core of TL leaders among students.

Our 1993 conference was successful in motivating several faculty. It also provided the start of an informal network with instructors from other colleges and school districts. One of the presenters at the conference is now the adjunct instructor for our microcomputer course and is helping to keep us moving along with the latest technology. The TL and the Director of ETC wrote another successful proposal for a computer conference, to be held in fall 1995. To engage our Teacher Education faculty, including the non-computer-users, we chose a theme, Equity and Excellence in Access to Computer Technology, that is consistent with the mission of our college and the Program. We plan to include a larger number of teacher education students in the planning and participation stages of this conference and hope this will create excitement and show them the relevance of computer literacy to the outside world.

Conclusion

Several factors were critical in our five-year cooperative effort. The first was to identify a TL who was willing to use professional development time and energy to become more knowledgeable, and who was committed to sharing that knowledge. There is considerable research that shows the importance of technology leaders and the factors that contribute to their success. (Kearsley and Lynch, 1994; Ferris and Roberts, 1994)

It was also important for the TL to support college-wide technology development by volunteering to serve on college-wide technology committees and maintaining cooperative relationships with other faculty who are TLs for their departments. A department's development can best flourish in the context of excitement over technology development for the whole campus. This participation also helped to ensure that the needs of the Teacher Education Program were kept in the forefront of college-wide deliberations regarding resources for technology.

A second critical factor was the support of program faculty and the college administration for the TL's sabbatical plans. Research shows the importance of such support. (Ferris and Roberts, 1994) A third was using the clout--even if only on paper--of outside groups such as the New York State Education Department and Middle States. Other colleges have used state mandates for changes in teacher certification programs as opportunities to include requirements for inclusion of technology in education coursework. (Roberts and Ferris, 1994) The Teacher Education Program at Old Westbury is also using the design of a new graduate program as an opportunity to enhance the technology component of the undergraduate and graduate curricula.

A fourth factor in our modest success was change in the Educational Technology Center itself. At a critical time, the Center's mission was clarified to support computer use and literacy development for the largest number of students. An important goal was to develop a systematic way to fairly distribute funds to support technology development. The new ETC director has been working to ensure that the needs of all campus programs are balanced. This is not easy to do and requires constant vigilance.

The Teacher Education Program and E.T.C. worked together patiently. Research indicates that awareness that change in a school is slow is one of the critical factors in successfully creating and maintaining technology leaders among the faculty. (Ferris and Roberts, 1994, p. 11) Ours has been a successful cooperation that is continuing. We find that sharing reflections on our journey, as we are doing with you today, is an important part of our planning for the future.

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